CLAIMS

1.   A method for providing fast network attachment detection with less signaling for IPv6 wireless access networks, comprising the steps of:

reporting, by a mobile node, an identifier of an unknown access point to one or more access routers on a same link;

disseminating, by the access routers, on-link access point identifiers;

ascertaining, by the mobile node, the reachability of its current default router, or the reachability of its previous default router and remaining uniqueness of its previous address; and

reusing, by the mobile node, its current or previous IPv6 address configuration to quickly gain Internet connectivity.

2.   The method according to claim 1, wherein the identifier of an access point obtainable from a L2 LinkUp hint is used to distinguish whether a point of attachment has been visited when a new L2 link is established.

3.   The method according to claim 1, wherein the identifier of an unknown access point is reported by the mobile node to all the on-link access routers in a multicast Router

Solicitation.

4.   The method according to claim 1, wherein the identifier of an unknown access point is reported by the mobile node to the mobile node's default access router chosen after normal address auto-configuration, in a unicast Router Solicitation.

5.   The method according to claim 1, wherein the access routers disseminate a list of the on-link access point identifiers in a multicast Router Advertisement.

6.   The method according to claim 1, wherein the mobile node's default access router disseminates a list of the on-link access point identifiers in a unicast Router Advertisement.

7.   The method according to claim 1, wherein the mobile node ascertains the reachability of its current or previous default access router by sending a unicast Router Solicitation without the Source Link Layer Address option, right after receiving the L2 LinkUp hint, and waiting for a solicited Router Advertisement.

8.   The method according to claim 1, wherein the mobile

node's current or previous default access router send back a unicast Router Advertisement with its global scope IPv6 address and a Solicitation bit set.

9.   The method according to claim 1, wherein the mobile node starts Optimistic Duplicate Address Detection with a smaller RetransTimer value, upon receiving the L2 LinkUp hint, to verify the remaining uniqueness of the previous address in a previously visited subnet.

10.   The method according to claim 1, wherein the mobile node continues to use its current IPv6 address configuration to quickly gain Internet connectivity after ascertaining the reachability of the current default access router.

11.   The method according to claim 1, wherein the mobile node reuses its previous IPv6 address configuration to quickly gain Internet connectivity after ascertaining the reachability of the previous default access router and completion of Optimistic Duplicate Address Detection.

12.   The method according to claim 3, wherein a global scope IPv6 address of the mobile node's current default access router is included in a Router Solicitation, and wherein the current default access router uses this information to

identify itself and sends out a multicast Router Advertisement with a list of the on-link access point identifiers.

5   13.   The method according to claim 5, wherein access routers which are not the mobile node's current default access router, do not disseminate a list of the on-link access point identifiers in a solicited multicast Router Advertisement if the access routers has already known a reported access
10   point identifier.

       14.   A system for storing information of known access point identifiers on a mobile node supporting a fast network attachment detection mechanism, the information of the known
15   access point identifier comprising:

              an identifier of the access point;

              a global scope IPv6 address of a mobile node's current default access router;

              a global scope IPv6 address and a link layer address
20   of a mobile node's previous default access router, and

              a prefix advertised by the default access router.

       15.   A system for storing information of known access point identifiers on a mobile node supporting a fast network
25   attachment detection mechanism, the information of the

access point identifier comprising:

an identifier of the access point;

a global scope IPv6 address of a mobile node's current default access router;

5 a global scope IPv6 address and a link layer address of a mobile node's previous default access router, and

prefix reference information to specify a prefix of the mobile node.

10 16. A method for maintaining a cache of access point identifiers on a mobile node, comprising the steps of:

creating an access point identifier cache entry when an unknown access point identifier is found in a disseminated identifier list;

15 removing a prefix reference element of an entry when valid lifetime of a prefix expires;

removing a default access router element of the entry when associated prefix references are all removed; and

removing the access point identifier entry when the 20 default access router element does not exist.

17. A method for maintaining a list of access point identifiers on an access router, comprising the steps of:

creating an access point identifier list entry when 25 an unknown access point identifier is reported by a mobile

node;

starting a lifetime timer when having created the access point identifier list entry;

refreshing the access point identifier list entry when the identifier is reported again by resetting and restarting an associated lifetime timer; and

removing the access point identifier list entry when the associated lifetime timer expires.